

ASME BPV Code, Section VIII, Division 1 Design & Fabrication of Pressure Vessels

INTRODUCTION

- The latest edition of ASME BPVC, Section VIII, Division 1 (2019) deals with requirements applicable to the design, fabrication, and inspection and testing of pressure vessels operating internally or externally.
- Based on the rules for pressure vessel design and construction, this training course is a comprehensive introduction to the requirements of Section VIII, Division 1 including background, organization, design, materials, fabrication, inspection, testing and documentation of pressure vessels. The more commonly used subsections and paragraphs will be covered, and a discussion of individual problems or situations will be included.

Delegates attending this training course will develop the following competencies:

- Understand the scope of the code rules
- Use of the code rules to more common design and fabrication situations
- Perform calculations for minimum required thickness
- Prepare design specifications

OBJECTIVES

By the end of this training course, participants will be able to:

- Be aware of the fabrication and inspection requirements during the fabrication of pressure vessels
- Be able to evaluate the necessity of impact toughness requirements for MOC
- Calculate the required hydrostatic test/pneumatic test pressure required for final testing
- Be able to read the pressure vessel drawing and review the inspection reports

WHO SHOULD ATTEND?

- Most of critical pressure vessels are found in the oil & gas industry, hence, this course would be beneficial to all personnel dealing with these vessels.

This training course is suitable to a wide range of professionals but will greatly benefit:

- PV Design Engineer
- Maintenance Engineer
- Inspection Engineer
- Corrosion Engineers
- Process Engineers
- Welding Engineers
- QA/QC Engineers

Course Outline

Introduction to Metallurgy and Material Properties

- Introduction to iron-iron carbide Equilibrium diagram (Fe-FeC Diagram)
- Engineering material properties (Tensile strength UTS, Ductility, Toughness, Hardness, Creep resistance & Weldability)
- Introduction to Destructive testing of materials (DT) - Tension test, Hardness test, Impact test and Bend test
- Introduction to conventional NDE (Non-Destructive Examination)

Basics of ASME VIII-1

- History of ASME BPV Codes
- Structure of ASME BPVC Section VIII Div-1
- Thin cylinder stress derivations
- ASME BPVC Section VIII Div-1 - scope and limitations (U.1)
- MOC mill tolerances

Design Thickness Calculation for Cylinder and Formed Heads

- Using ASME Section II Part D to obtain allowable stress (S)
- Weld joints types and categories of joints (UW-12)
- Types of loadings on pressure vessel (UG-22)
- Liquid static head calculations, manual problem solving

Welding, PWHT, Impact Toughness & NDE Procedures

- Special welding requirements (UW)
- Welding tolerances (Visual)
- PWHT exemption requirements in ASME codes
- Procedures and methods for PWHT
- Impact test code exemption curves
- Impact test acceptance criteria
- Types of radiography
- NDE Methods – Acceptance criteria

Pressure Testing Requirements and Marking/Reporting Requirements

- Hydrostatic test procedure and code requirements
- Pneumatic test procedure and code requirements
- Understanding pressurization stages, test temperatures, test time
- Marking requirements
- ASME VIII-1 forms and certification